



**EBERLINE**  
SERVICES

0056244

H1458

November 7, 2001

Ms. Joan Kessner  
Bechtel Hanford Inc.  
3350 George Washington Way  
Richland, WA 99352  
MSIN: H9-03

Reference: **P.O. #630**  
**Eberline Services R1-08-075-7053, SDG H1458**

Dear Ms. Kessner:

Enclosed is the data report for one water sample designated under SAF No. B01-059 received at Eberline Services on August 15, 2001. The sample was analyzed according to the accompanying chain-of-custody document.

Please call if you have any questions concerning this report.

Sincerely,

Melissa C. Mannion  
Program Manager

MCM

Enclosure: Data Package

**RECEIVED**  
JAN 24 2002  
**EDMC**



Analytical Services  
2030 Wright Avenue  
P.O. Box 4040  
Richmond, California 94804-0040  
(510) 235-2633 Fax (510) 235-0438  
Toll Free (800) 841-5487  
[www.eberlineservices.com](http://www.eberlineservices.com)

## 1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H158 was composed of one water sample designated under SAF No. B01-059 with a Project Designation of: 200-TW-1&2-QC Sampling.

The sample was received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to BHI via e-Fax on November 1, 2001.

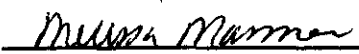
## 2.0 ANALYSIS NOTES

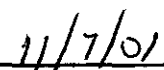
### 2.1 Gross Alpha and Beta Analyses

The samples (planchets) were reworked (reburned) in chemistry to burn off a build-up of salts that were interfering with counting. No other problems were encountered during the course of the analyses.

### Case Narrative Certification Statement

**"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."**

  
\_\_\_\_\_  
Melissa C. Mannion  
Program Manager

  
\_\_\_\_\_  
Date

EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP H1458

SDG 7053  
Contact Melissa C. Mannion

Client Hanford  
Contract No. 630  
Case no SDG\_H1458

S U M M A R Y   D A T A   S E C T I O N

T A B L E   O F   C O N T E N T S				
About this section	.	.	.	1
Sample Summaries	.	.	.	3
Prep Batch Summary	.	.	.	5
Work Summary	.	.	.	6
Method Blanks	.	.	.	7
Lab Control Samples	.	.	.	8
Duplicates	.	.	.	9
Data Sheets	.	.	.	10
Method Summaries	.	.	.	11
Report Guides	.	.	.	13
End of Section	.	.	.	27

Melissa Mannion  
Prepared by  
  
Melissa Mannion  
Reviewed by

Lab id TMANC  
Protocol Hanford  
Version Ver 1.0  
Form DVD-TOC  
Version 3.06  
Report date 11/01/01

# EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1458

SDG 7053  
Contact Melissa C. Mannion

## REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG\_H1458

### ABOUT THE DATA SUMMARY SECTION

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

#### SAMPLE SUMMARIES

The Sample and QC Summary Reports show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

#### PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

#### WORK SUMMARY

The Work Summary Report shows all samples and work done on them relevant to the reported SDG.

#### METHOD BLANKS

The Method Blank Reports, one for each Method Blank relevant to the SDG, show all results and primary supporting information for the blanks.

#### LAB CONTROL SAMPLES

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

#### REPORT GUIDES

Page 1

#### SUMMARY DATA SECTION

Page 1

Lab id TMANC  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 11/01/01

# EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1458

SDG 7053  
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
Contract No. 630  
Case no SDG H1458

## ABOUT THE DATA SUMMARY SECTION

### DUPLICATES

The Duplicate Reports, one for each Duplicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

### MATRIX SPIKES

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

### DATA SHEETS

The Data Sheet Reports, one for each client sample in the SDG, show all results and primary supporting information for these samples.

### METHOD SUMMARIES

The Method Summary Reports, one for each test used in the SDG, show all results, QC and method performance data for one analyte on one or two pages. (A test is a short code for the method used to do certain work to the client's specification.)

### REPORT GUIDES

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.

### REPORT GUIDES

Page 2

### SUMMARY DATA SECTION

Page 2

Lab id TMANC  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 11/01/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1458

SDG 7053

Contact Melissa C. Mannion

## SAMPLE SUMMARY

Client Hanford

Contract No. 630

Case no SDG H1458

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B12DB4	T-26/200 W	WATER		R108075-01	B01-059	B01-059-009	08/10/01 03:00
Method Blank		WATER		R108075-03	B01-059		
Lab Control Sample		WATER		R108075-02	B01-059		
Duplicate (R108075-01)	T-26/200 W	WATER		R108075-04	B01-059		08/10/01 03:00

### SAMPLE SUMMARY

Page 1

### SUMMARY DATA SECTION

Page 3

Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-CS

Version 3.06

Report date 11/01/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1458

## QC SUMMARY

SDG 7053

Contact Melissa C. Mannion

Client Hanford

Contract No. 630

Case no SDG H1458

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL SAMPLE ID	DEPARTMENT SAMPLE ID
7053	B01-059-009	B12DB4	WATER		2.0 L		08/15/01 5	R108075-01	7053-001
		Method Blank	WATER					R108075-03	7053-003
		Lab Control Sample	WATER					R108075-02	7053-002
		Duplicate (R108075-01)	WATER		2.0 L		08/15/01 5	R108075-04	7053-004

QC SUMMARY

Page 1

SUMMARY DATA SECTION

Page 4

Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-QS

Version 3.06

Report date 11/01/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1458

SDG 7053

Contact Melissa C. Mannion

## PREP BATCH SUMMARY

Client Hanford

Contract No. 630

Case no SDG H1458

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED				QUALI-	
			BATCH	2σ %	CLIENT	MORE	RE	BLANK		LCS
Gas Proportional Counting										
93A	WATER	Gross Alpha in Water	6994-190	20.0	1			1	1	1/1
93B	WATER	Gross Beta in Water	6994-190	15.0	1			1	1	1/1

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.

Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

PREP BATCH SUMMARY

Page 1

SUMMARY DATA SECTION

Page 5

Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-PBS

Version 3.06

Report date 11/01/01

**EBERLINE SERVICES/RICHMOND**  
SAMPLE DELIVERY GROUP H1458

SDG 7053  
Contact Melissa C. Mannion

**WORK SUMMARY**

Client Hanford  
Contract No. 630  
Case no SDG H1458

CLIENT SAMPLE ID LOCATION CUSTODY	SAF No	MATRIX	LAB SAMPLE ID COLLECTED RECEIVED	PLANCHET	TEST	SUF- FIX	ANALYZED	REVIEWED	BY	METHOD
B12DB4			R108075-01	7053-001	93A/93	R1	10/27/01	11/01/01	MCM	Gross Alpha in Water
T-26/200 W		WATER	08/10/01	7053-001	93B/93	R1	10/27/01	11/01/01	MCM	Gross Beta in Water
B01-059-009	B01-059		08/15/01							
Method Blank			R108075-03	7053-003	93A/93	R1	10/27/01	11/01/01	MCM	Gross Alpha in Water
		WATER		7053-003	93B/93	R1	10/27/01	11/01/01	MCM	Gross Beta in Water
	B01-059									
Lab Control Sample			R108075-02	7053-002	93A/93	R1	10/27/01	11/01/01	MCM	Gross Alpha in Water
		WATER		7053-002	93B/93	R1	10/27/01	11/01/01	MCM	Gross Beta in Water
	B01-059									
Duplicate (R108075-01)			R108075-04	7053-004	93A/93	R1	10/27/01	11/01/01	MCM	Gross Alpha in Water
T-26/200 W		WATER	08/10/01	7053-004	93B/93	R1	10/27/01	11/01/01	MCM	Gross Beta in Water
	B01-059		08/15/01							

COUNTS OF TESTS BY SAMPLE TYPE										
TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
93A/93	B01-059	Gross Alpha in Water	900.0_ALPHABETA_GPC	1			1	1	1	4
93B/93	B01-059	Gross Beta in Water	900.0_ALPHABETA_GPC	1			1	1	1	4
TOTALS				2			2	2	2	8

WORK SUMMARY

Page 1

SUMMARY DATA SECTION

Page 6

Lab id TMANC  
Protocol Hanford  
Version Ver 1.0  
Form DVD-CWS  
Version 3.06  
Report date 11/01/01

**EBERLINE SERVICES / RICHMOND**

**SAMPLE DELIVERY GROUP H1458**

**R108075-03**

**Method Blank**

**METHOD BLANK**

<u>SDG 7053</u>	<u>Client/Case no Hanford</u>	<u>SDG H1458</u>
<u>Contact Melissa C. Mannion</u>	<u>Contract No. 630</u>	
<u>Lab sample id R108075-03</u>	<u>Client sample id Method Blank</u>	
<u>Dept sample id 7053-003</u>	<u>Material/Matrix</u>	<u>WATER</u>
	<u>SAF No B01-059</u>	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	-0.033	0.54	1.1	3.0	U	93A
Gross Beta	12587-47-2	-0.019	1.8	3.1	4.0	U	93B

200-TW-1 & 2-QC Sampling

QC-BLANK 39634
----------------

<u>Lab id TMANC</u>
<u>Protocol Hanford</u>
<u>Version Ver 1.0</u>
<u>Form DVD-DS</u>
<u>Version 3.06</u>
<u>Report date 11/01/01</u>

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H1458

R108075-02

Lab Control Sample

**LAB CONTROL SAMPLE**

SDG <u>7053</u> Contact <u>Melissa C. Mannion</u>  Lab sample id <u>R108075-02</u> Dept sample id <u>7053-002</u>	Client/Case no <u>Hanford</u> SDG <u>H1458</u> Case no <u>No. 630</u>  Client sample id <u>Lab Control Sample</u> Material/Matrix _____ <u>WATER</u> SAF No <u>B01-059</u>
---	---

ANALYTE	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST	ADDED pCi/L	2σ ERR pCi/L	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Gross Alpha	76.0	5.1	1.2	3.0		93A	66.7	2.7	114	63-137	70-130
Gross Beta	71.6	3.7	2.7	4.0		93B	72.7	2.9	98	76-124	70-130

200-TW-1 & 2-QC Sampling

QC-LCS 39633
--------------

Lab id <u>TMANC</u> Protocol <u>Hanford</u> Version <u>Ver 1.0</u> Form <u>DVD-LCS</u> Version <u>3.06</u> Report date <u>11/01/01</u>
---

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1458

R108075-04

B12DB4

## DUPLICATE

SDG <u>7053</u>	Client/Case no <u>Hanford</u>	SDG <u>H1458</u>
Contact <u>Melissa C. Mannion</u>	Case no <u>No. 630</u>	
<b>DUPLICATE</b>	<b>ORIGINAL</b>	
Lab sample id <u>R108075-04</u>	Lab sample id <u>R108075-01</u>	Client sample id <u>B12DB4</u>
Dept sample id <u>7053-004</u>	Dept sample id <u>7053-001</u>	Location/Matrix <u>T-26/200 W</u> <u>WATER</u>
	Received <u>08/15/01</u>	Collected/Volume <u>08/10/01 03:00</u> <u>2.0 L</u>
		Custody/SAF No <u>B01-059-009</u> <u>B01-059</u>

ANALYTE	DUPLICATE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST	ORIGINAL pCi/L	2σ ERR (COUNT)	MDA pCi/L	QUALI- FIERS	RPD %	3σ PROT TOT LIMIT
Gross Alpha	0.057	0.56	1.1	3.0	U	93A	-0.180	0.42	0.95	U	-	
Gross Beta	-1.12	1.5	2.7	4.0	U	93B	0.651	1.8	3.0	U	-	

200-TW-1 & 2-QC Sampling

QC-DUP#1 39635

EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP H1458

R108075-01

B12DB4

DATA SHEET

SDG <u>7053</u>	Client/Case no <u>Hanford</u>	SDG <u>H1458</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
Lab sample id <u>R108075-01</u>	Client sample id <u>B12DB4</u>	
Dept sample id <u>7053-001</u>	Location/Matrix <u>T-26/200 W</u>	<u>WATER</u>
Received <u>08/15/01</u>	Collected/Volume <u>08/10/01 03:00</u>	<u>2.0 L</u>
	Custody/SAF No <u>B01-059-009</u>	<u>B01-059</u>

ANALYTE	CAS NO	RESULT pCi/L	2 $\sigma$ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	-0.180	0.42	0.95	3.0	U	93A
Gross Beta	12587-47-2	0.651	1.8	3.0	4.0	U	93B

200-TW-1 & 2-QC Sampling

DATA SHEETS

Page 1

SUMMARY DATA SECTION

Page 10

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>11/01/01</u>

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1458

Test 93A Matrix WATER  
SDG 7053  
Contact Melissa C. Mannion

## METHOD SUMMARY

GROSS ALPHA IN WATER  
GAS PROPORTIONAL COUNTING

Client Hanford  
Contract No. 630  
Contract SDG H1458

## RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Gross Alpha
------------------	------------------	-------------	-------------	----------	-------------

Preparation batch 6994-190

B12DB4	R108075-01	93	R1	7053-001	U
BLK (QC ID=39634)	R108075-03	93	R1	7053-003	U
LCS (QC ID=39633)	R108075-02	93	R1	7053-002	ok
Duplicate (R108075-01)	R108075-04	93	R1	7053-004	- U

Nominal values and limits from method RDLs (pCi/L) 3.0  
200-TW-1 & 2-QC Sampling

## METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU- TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
------------------	------------------	-------------	-------------	--------------	-----------	-------------	---------------	-------------	----------	--------------	-------------	--------------	--------------	-------------------	------	----------

Preparation batch 6994-190 2σ prep error 20.0 % Reference Lab Notebook 6994 pg. 190

B12DB4	R108075-01	93	R1	0.95	0.300			4	100			78	10/27/01	10/27	GAW-114
BLK (QC ID=39634)	R108075-03	93	R1	1.1	0.300			20	100				10/27/01	10/27	GAW-114
LCS (QC ID=39633)	R108075-02	93	R1	1.2	0.300			19	100				10/27/01	10/27	GAW-115
Duplicate (R108075-01) (QC ID=39635)	R108075-04	93	R1	1.1	0.300			4	100			78	10/27/01	10/27	GAW-115

Nominal values and limits from method 3.0 0.300 5-250 100 180

PROCEDURES	REFERENCE	900.0 ALPHABETA_GPC
CP-060	Soil Preparation, rev 3	
CP-070	Soil Dissolution, < 1.0g Aliquot, rev 4	
CP-170	Soil Preparation for Direct Gross Alpha and Gross Beta Counting, rev 3	

AVERAGES ± 2 SD	MDA	1.1 ± 0.21
FOR 4 SAMPLES	RESIDUE	12 ± 18

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1458

Test 93B Matrix WATER

SDG 7053

Contact Melissa C. Mannion

## METHOD SUMMARY

GROSS BETA IN WATER

GAS PROPORTIONAL COUNTING

Client Hanford

Contract No. 630

Contract SDG H1458

## RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Gross Beta
------------------	------------------	-------------	-------------	----------	------------

Preparation batch 6994-190

B12DB4	R108075-01	93	R1	7053-001	U
BLK (QC ID=39634)	R108075-03	93	R1	7053-003	U
LCS (QC ID=39633)	R108075-02	93	R1	7053-002	ok
Duplicate (R108075-01)	R108075-04	93	R1	7053-004	- U

Nominal values and limits from method RDLs (pCi/L) 4.0  
200-TW-1 & 2-QC Sampling

## METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU- TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- YZED	DETECTOR
------------------	------------------	-------------	-------------	--------------	-----------	-------------	---------------	-------------	----------	--------------	-------------	--------------	--------------	---------------	----------

Preparation batch 6994-190 2σ prep error 15.0 % Reference Lab Notebook 6994 pg. 190

B12DB4	R108075-01	93	R1	3.0	0.300			4	100			78	10/27/01	10/27	GRB-114
BLK (QC ID=39634)	R108075-03	93	R1	3.1	0.300			20	100				10/27/01	10/27	GRB-114
LCS (QC ID=39633)	R108075-02	93	R1	2.7	0.300			19	100				10/27/01	10/27	GRB-115
Duplicate (R108075-01) (QC ID=39635)	R108075-04	93	R1	2.7	0.300			4	100			78	10/27/01	10/27	GRB-115

Nominal values and limits from method 4.0 0.300 5-250 100 180

PROCEDURES	REFERENCE	900.0_ALPHA_BETA_GPC
CP-060	Soil Preparation, rev 3	
CP-070	Soil Dissolution, < 1.0g Aliquot, rev 4	
CP-170	Soil Preparation for Direct Gross Alpha and Gross Beta Counting, rev 3	

AVERAGES ± 2 SD	MDA	2.9 ± 0.41
FOR 4 SAMPLES	RESIDUE	12 ± 18

## METHOD SUMMARIES

Page 2

## SUMMARY DATA SECTION

Page 12

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	11/01/01

# EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1458

SDG 7053  
Contact Melissa C. Mannion

## REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG H1458

## SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

- \* LAB SAMPLE ID is the lab's primary identification for a sample.
- \* DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.
- \* CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.
- \* QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

- \* All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

### REPORT GUIDES

Page 1

### SUMMARY DATA SECTION

Page 13

Lab id TMANC  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 11/01/01

# EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1458

SDG 7053  
Contact Melissa C. Mannion

## REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG H1458

### PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

- \* The preparation batches are shown in the same order as the Method Summary Reports are printed.
- \* Only analyses of planchets relevant to the SDG are included.
- \* Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.
- \* The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

These qualifiers should be reviewed as follows:

- X Some data has been manually entered or modified. Transcription errors are possible.
- P One or more results are 'preliminary'. The data is not ready for final reporting.
- 2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

#### REPORT GUIDES

Page 2

#### SUMMARY DATA SECTION

Page 14

Lab id TMANC  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 11/01/01

# EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1458

SDG 7053  
Contact Melissa C. Mannion

## REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG\_H1458

## WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

- \* TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.
- \* SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.
- \* The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.
- \* PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.
- \* For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.
- \* The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

### REPORT GUIDES

Page 3

### SUMMARY DATA SECTION

Page 15

Lab id TMNC  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 11/01/01

# EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1458

SDG 7053  
Contact Melissa C. Mannion

## REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG H1458

## DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

- \* TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.
- \* The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

- \* ERRORS can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.
- \* A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.
- \* When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

U The RESULT is less than the MDA (Minimum Detectable Activity).

### REPORT GUIDES

Page 4

### SUMMARY DATA SECTION

Page 16

Lab id TMANC  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 11/01/01

# EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1458

SDG 7053  
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
Contract No. 630  
Case no SDG H1458

## DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

- J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.
- B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.

For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.

- L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.
- H Similar to 'L' except the recovery was high.
- P The RESULT is 'preliminary'.
- X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.
- 2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

- \* An MDA is underlined if it is bigger than its RDL.

### REPORT GUIDES

Page 5

### SUMMARY DATA SECTION

Page 17

Lab id TMANC  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 11/01/01

# EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1458

SDG 7053  
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
Contract No. 630  
Case no SDG H1458

## DATA SHEET

- \* An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.
- \* A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.
- \* When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

### REPORT GUIDES

Page 6

### SUMMARY DATA SECTION

Page 18

Lab id TMANC  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 11/01/01

# EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1458

SDG 7053  
Contact Melissa C. Mannion

## REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG\_H1458

### LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

- \* All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.
- \* An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- \* REC (Recovery) is RESULT divided by ADDED expressed as a percent.
- \* The first, computed limits for the recovery reflect:
  1. The error of RESULT, including that introduced by rounding the result prior to printing.
 

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.
  2. The error of ADDED.
  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.
- \* The second limits are protocol defined upper and lower QC limits for the recovery.
- \* The recovery is underlined if it is outside either of these ranges.

# EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1458

SDG 7053  
Contact Melissa C. Mannion

## REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG H1458

### DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

- \* All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTS are underlined.

- \* The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTS divided by their average expressed as a percent.

If both RESULTS are less than their MDAs, no RPD is computed and a '-' is printed.

For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

- \* The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTS prior to printing.

If this limit is labeled TOT, it includes the preparation error in the RESULTS. If labeled CNT, it does not.

This value reported for this limit is at most 999.

- \* The second limit for the RPD is the larger of:
  1. A fixed percentage specified in the protocol.

#### REPORT GUIDES

Page 8

#### SUMMARY DATA SECTION

Page 20

Lab id TMANC  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 11/01/01

# EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1458

SDG 7053

Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford

Contract No. 630

Case no SDG H1458

## DUPLICATE

2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

- \* The RPD is underlined if it is greater than either limit.
- \* If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

- \* The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

### REPORT GUIDES

Page 9

### SUMMARY DATA SECTION

Page 21

Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-RG

Version 3.06

Report date 11/01/01

# EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1458

SDG 7053  
Contact Melissa C. Mannion

## REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG H1458

## MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

- \* All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTS are underlined.

- \* An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- \* REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

- \* The first, computed limits for the recovery reflect:

1. The errors of the two RESULTS, including those introduced by rounding them prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

2. The error of ADDED.

3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

- \* The second limits are protocol defined upper and lower QC limits

### REPORT GUIDES

Page 10

### SUMMARY DATA SECTION

Page 22

Lab id TMANC  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 11/01/01

# EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1458

SDG 7053  
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
Contract No. 630  
Case no SDG\_H1458

## MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

- \* The recovery is underlined (out of spec) if it is outside either of these ranges.

### REPORT GUIDES

Page 11

### SUMMARY DATA SECTION

Page 23

Lab id TMANC  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 11/01/01

SDG 7053  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG H1458

METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

- \* Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

- \* The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

- \* If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

The J and X flags are as on the data sheet.

- \* Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.
- \* Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

REPORT GUIDES

Page 12

SUMMARY DATA SECTION

Page 24

Lab id TMANC  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 11/01/01

# EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1458

SDG 7053  
Contact Melissa C. Mannion

GUIDE , c o n t .

Client Hanford  
Contract No. 630  
Case no SDG H1458

## METHOD SUMMARY

means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

- \* Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.
- \* If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

MDAs are underlined if greater than the printed RDL.

- \* Aliquots are underlined if less than the nominal value specified for the method.
- \* Preparation factors are underlined if greater than the nominal value specified for the method.
- \* Dilution factors are underlined if greater than the nominal value specified for the method.
- \* Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.
- \* Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.
- \* Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

### REPORT GUIDES

Page 13

### SUMMARY DATA SECTION

Page 25

Lab id TMANC  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 11/01/01

# EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1458

SDG 7053  
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
Contract No. 630  
Case no SDG\_H1458

## METHOD SUMMARY

- \* Count times are underlined if less than the nominal value specified for the method.
- \* Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.
- \* Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.
- \* Days Held are underlined if greater than the holding time specified in the protocol.
- \* Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1+3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

### REPORT GUIDES

Page 14

### SUMMARY DATA SECTION

Page 26

Lab id TMANC  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 11/01/01

# EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1458

SDG 7053  
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
Contract No. 630  
Case no SDG H1458

## METHOD SUMMARY

results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

### REPORT GUIDES

Page 15

### SUMMARY DATA SECTION

Page 27

Lab id TMANC  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 11/01/01

<b>Bechtel Hanford Inc.</b>		<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b>				<b>B01-059-009</b>		Page 1 of 1						
Collector Thomas, G/Watson, D.		Company Contact Todd, M.		Telephone No. (509)372-9631		Project Coordinator TRENT, SJ		Price Code 7N      Data Turnaround 45 Days						
Project Designation 200-TW-1 & 2 - QC Sampling		Sampling Location T-26/200 W <i>H1458 (7053)</i>		SAF No. B01-059		Air Quality <input type="checkbox"/>								
Ice Chest No. <i>SML 457</i>		Field Logbook No. EL-1518 - 1		COA B20TW2674C		Method of Shipment Fed Ex								
Shipped To <i>7/18/01</i> <del>TMA/RECR</del> <i>Eberline</i>		Offsite Property No. <i>A010274</i>		Bill of Lading/Air Bill No. <i>423579540437</i>										
POSSIBLE SAMPLE HAZARDS/REMARKS  Special Handling and/or Storage				Preservation	HNO <sub>3</sub> to pH < 2	Cool 4C	H <sub>2</sub> SO <sub>4</sub> to pH < 2 Cool 4C	HCl or H <sub>2</sub> SO <sub>4</sub> to pH < 2 Cool	Cool 4C	HNO <sub>3</sub> to pH < 2				
				Type of Container	aG	aG	aG	aGs*	aG	aG				
				No. of Container(s)	1	1	1	3	2	2				
				Volume	500mL	500mL	500mL	40mL	1000mL	1000mL				
SAMPLE ANALYSIS				See item (1) in Special Instructions.	See item (2) in Special Instructions.	Ammonia - 350.3; NO <sub>2</sub> /NO <sub>3</sub> - 353.1; TDC - 9060	VOA - 8260A (SCL)	Semi-VOA - 8270A (Add-On) (Tributyl phosphate)	Gross Alpha; Gross Beta					
Sample No.	Matrix *	Sample Date	Sample Time											
B12DB4	WATER	8/10/01	0300							X				
<b>CHAIN OF POSSESSION</b>				<b>SPECIAL INSTRUCTIONS</b>				<b>Matrix *</b>						
Relinquished By/Removed From <i>Greg Thomas / Greg Thomas</i>		Date/Time <i>0745 8/14/01</i>		Received By/Stored In <i>Ref 2C</i>		Date/Time <i>0745 8/10/01</i>		<p>** The BRC acknowledges that the analytical holding time for Nitrate by EPA Method 300.0 will not be met.</p> <p>(1) ICP Metals - 6010A (PAL) (Cadmium, Chromium, Copper, Nickel, Silver); ICP Metals - 6010A (Add-On) (Lead)</p> <p>(2) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate)</p> <p>Samples did not originate in radiological controlled area. No total activity associated with sample/samples.</p> <p>Samples stored in Ref.# <i>2C</i> at the 3728 Shipping Facility on <i>8/10/01</i>. Collector not available to relinquish samples on <i>8/14/01</i> for shipment.</p>						
Relinquished By/Removed From <i>REF 2C</i>		Date/Time <i>8/14/01 1000</i>		Received By/Stored In <i>SOURCE - Mobile</i>		Date/Time <i>8/14/01 1000</i>								
Relinquished By/Removed From <i>SOURCE Mobile</i>		Date/Time <i>8/14/01 1000</i>		Received By/Stored In <i>FED EX</i>		Date/Time <i>8-14-01</i>								
Relinquished By/Removed From <i>Fed Ex</i>		Date/Time <i>8-15-01 9:45</i>		Received By/Stored In <i>DR Pardo / ALCOA</i>		Date/Time <i>8-15-01</i>								
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time								
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time								
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time								
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time								
LABORATORY SECTION		Received By		Title		Date/Time								
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time								

## SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT			
Client:	<u>Bchtel Hanford</u>		Date/Time received <u>8-15-01 9:45</u>
CoC No.	<u>B01-05B-148, B01-05B-149, B01-05B-160, B01-05B-151 &amp; B01-05B-009</u>		
Container I.D. No.	<u>SML-457</u>	Requested TAT (Days)	<u>45</u> P.O. Received Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
INSPECTION			
1.	Custody seals on shipping container intact?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
2.	Custody seals on shipping container dated & signed?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
3.	Custody seals on sample containers intact?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
4.	Custody seals on sample containers dated & signed?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
5.	Cooler Temperature: _____	Packing material is: Wet <input type="checkbox"/> Dry <input checked="" type="checkbox"/>	
6.	Number of samples in shipping container:	<u>5</u>	
7.	Number of containers per sample: _____	(Or see CoC <input checked="" type="checkbox"/> )	
8.	Paperwork agrees with samples?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
9.	Samples have: Tape <input checked="" type="checkbox"/> Hazard labels <input type="checkbox"/> Rad labels <input checked="" type="checkbox"/> Appropriate sample labels <input checked="" type="checkbox"/>		
10.	Samples are: In good condition <input checked="" type="checkbox"/> Leaking <input type="checkbox"/> Broken Container <input type="checkbox"/> Missing <input type="checkbox"/>		
11.	Describe any anomalies: _____ _____ _____ _____		
13.	Was P.M. notified of any anomalies?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Date <u>8-15-01</u>	
14.	Received by <u>J.P. Curran</u>	Date: <u>8-15-01</u> Time: <u>9:45</u>	
LOGIN			
TNU W.O. No.	Group No.	Client W.O. No.	
PROGRAM MANAGER			
Sample holding times exceeded?	Yes <input type="checkbox"/> No <input type="checkbox"/>		
Client Notified: Name _____	Date/time _____		

Lionville Laboratory, Inc.  
VOA ANALYTICAL DATA PACKAGE FOR  
TNUHANFORD B01-059 H1458

RFW LOT # :0108L570

CLIENT ID	RFW #	MTX	PREP #	COLLECTN DATE	REC	EXT/PREP	ANALYSIS
B12DB4	001	W	01LVX326	08/10/01	08/15/01	N/A	08/16/01
B12DB4	001 MS	W	01LVX326	08/10/01	08/15/01	N/A	08/16/01
B12DB4	001 MSD	W	01LVX326	08/10/01	08/15/01	N/A	08/16/01
LAB QC:							
VELKLS	MB1	W	01LVX326	N/A	N/A	N/A	08/16/01
VELKLS	MB1 BS	W	01LVX326	N/A	N/A	N/A	08/16/01





**Client:** TNU-HANFORD B01-059  
**RFW #:** 0108L570  
**SDG/SAF #:** H1458/B01-059

**W.O. #:** 11343-606-001-9999-00  
**Date Received:** 08-15-2001

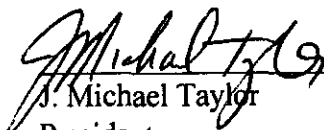
### GC/MS VOLATILE

One (1) water sample was collected on 08-10-2001.

The sample and its associated QC samples were analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8260A for TCL Volatile target compounds on 08-16-2001.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. The cooler temperature upon receipt has been recorded on the chain-of-custody.
2. The sample was analyzed within required holding time.
3. Non-target compounds were not detected in the sample.
4. All surrogate recoveries were within EPA QC limits.
5. All matrix spike recoveries were within EPA QC limits.
6. All blank spike recoveries were within EPA QC limits.
7. The method blank contained the common laboratory contaminant Methylene Chloride at levels less than the CRQL.
8. Internal standard area and retention time criteria were met.
9. "I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

  
J. Michael Taylor  
President  
Lionville Laboratory Incorporated

9/10/01  
Date



som\group\data\voa\tnu-hanford\0108-570.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 9 pages.

## GLOSSARY OF VOA DATA

### DATA QUALIFIERS

- U** = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
- J** = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B** = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
- E** = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- D** = Identifies all compounds identified in an analysis at a secondary dilution factor.
- I** = Interference.
- NQ** = Result qualitatively confirmed but not able to quantify.
- N** = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
- X** = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
- Y** = Additional qualifiers used as required are explained in the case narrative.

## GLOSSARY OF VOA DATA

### ABBREVIATIONS

<b>BS</b>	<b>=</b>	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.
<b>BSD</b>	<b>=</b>	Indicates blank spike duplicate.
<b>MS</b>	<b>=</b>	Indicates matrix spike.
<b>MSD</b>	<b>=</b>	Indicates matrix spike duplicate.
<b>DL</b>	<b>=</b>	Suffix added to sample number to indicate that results are from a diluted analysis.
<b>NA</b>	<b>=</b>	Not Applicable.
<b>DF</b>	<b>=</b>	Dilution Factor.
<b>NR</b>	<b>=</b>	Not Required.
<b>SP, Z</b>	<b>=</b>	Indicates Spiked Compound.

## TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quantitation modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quantitation modifications:

- MP** - **Missed Peak:** manually added peak not found by automatic quantitation program.
- PA** - **Peak Assignment:** quantitation report was changed to reflect correct peak assignment.
- RI** - **Routine Integration:** routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.
- SP** - **Split Peak:** the automatic integration improperly split the peak; a manual integration was performed to get the correct area.
- CB** - **Coelution/Background:** peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.
- PI** - **Proper Integration:** a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

Report Date: 09/10/01 13:48

Client: **TNUHANFORD B01-059 H1458** Work Order: 11343606001 Page: 1a

4.

Cust ID:	B12DB4	B12DB4	B12DB4	VBLKLS	VBLKLS BS
Sample Information	RFW#: Matrix: D.F.: Units:	001 WATER 1.00 ug/L	001 MS WATER 1.00 ug/L	001 MSD WATER 1.00 ug/L	01LVX326-MB1 WATER 1.00 ug/L
Surrogate Recovery	Toluene-d8 Bromofluorobenzene 1,2-Dichloroethane-d4	96 % 102 % 100 %	97 % 102 % 101 %	95 % 105 % 101 %	96 % 96 % 98 %
=====fl=====	=====fl=====	=====fl=====	=====fl=====	=====fl=====	=====fl=====
Chloromethane	10 U	10 U	10 U	10 U	10 U
Bromomethane	10 U	10 U	10 U	10 U	10 U
Vinyl Chloride	10 U	10 U	10 U	10 U	10 U
Chloroethane	10 U	10 U	10 U	10 U	10 U
Methylene Chloride	7 B	7 B	7 B	4 J	7 B
Acetone	10 U	10 U	10 U	10 U	10 U
Carbon Disulfide	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene	5 U	89 %	88 %	5 U	94 %
1,1-Dichloroethane	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethene (total)	5 U	5 U	5 U	5 U	5 U
Chloroform	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane	5 U	5 U	5 U	5 U	5 U
2-Butanone	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	5 U	5 U	5 U	5 U	5 U
Carbon Tetrachloride	5 U	5 U	5 U	5 U	5 U
Bromodichloromethane	5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane	5 U	5 U	5 U	5 U	5 U
cis-1,3-Dichloropropene	5 U	5 U	5 U	5 U	5 U
Trichloroethene	5 U	104 %	102 %	5 U	102 %
Dibromochloromethane	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	5 U	5 U	5 U	5 U	5 U
Benzene	5 U	96 %	93 %	5 U	97 %
Trans-1,3-Dichloropropene	5 U	5 U	5 U	5 U	5 U
Bromoform	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone	10 U	10 U	10 U	10 U	10 U
2-Hexanone	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	5 U	5 U	5 U	5 U	5 U
Toluene	5 U	98 %	95 %	5 U	107 %

\*= Outside of EPA CLP OC limits.

Cust ID: B12DB4 B12DB4 B12DB4 VBLKLS VBLKLS BS

RFW#: 001 001 MS 001 MSD 01LVX326-MB1 01LVX326-MB1

Chlorobenzene	5 U	99 %	98 %	5 U	99 %
Ethylbenzene	5 U	5 U	5 U	5 U	5 U
Styrene	5 U	5 U	5 U	5 U	5 U
Xylene (total)	5 U	5 U	5 U	5 U	5 U

\*= Outside of EPA CLP QC limits.

**ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

[illegible][illegible]

Special Instructions: Saf B01-059

**DATE/REVISIONS:**

DATE: \_\_\_\_\_

Q.1. Write the chemical formulae of the following compounds:

(a) Metal 1. Cd, Cr, Cu, Ni, Ag, Pb

(b) IC 2. TiCl, TiCl<sub>2</sub>, TiCl<sub>3</sub>, TiCl<sub>4</sub>, TiCl<sub>5</sub>, TiCl<sub>6</sub>

(c) \_\_\_\_\_ 3. \_\_\_\_\_

(d) \_\_\_\_\_ 4. \_\_\_\_\_

(e) \_\_\_\_\_ 5. \_\_\_\_\_

(f) \_\_\_\_\_ 6. \_\_\_\_\_

**Lionville Laboratory Use Only**

Samples were: ☒ or  
1) Shipped ☒ or  
Hand Delivered ☐  
Airbill # 12 35 7954 6440  
2) Ambient or Cooled  
3) Received in Good  
Condition ☒ or N  
4) Samples  
Properly Preserved ☒ or N  
5) Received Within 2  
Holding Times Dec 23  
☒ or Post ☒  
TR 813-1

Tamper Resistant Seal was:  
1) Present on Outer  
Package ☒ or N  
2) Unbroken on Outer  
Package ☒ or N  
3) Present on Sample  
☒ or N  
4) Unbroken on  
Sample ☒ or N  
COC Record Present  
Upon Sample Rec'd ☒ or N  
Cooler  
Temp. 20 °C

Relinquished by	Received by	Date	Time
HeoEx	D. J. [Signature]	9/15/01	0940

Relinquished by	Received by	Date	Time
<b>COMPOSITE WASTE</b>		<b>ORIGINAL</b>	

Discrepancies Between  
Samples Labels and  
COC Record? Y or ☒ N

NOTES:

TR 815.

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						B01-059-009 Page 1 of 1						
Collector Thomas, G/Watson, D.		Company Contact Todd, M.		Telephone No. (509)372-9631		Project Coordinator TRENT, SJ		Price Code 7N Data Turnaround						
Project Designation 200-TW-1 & 2 - QC Sampling		Sampling Location T-26/200 W		SAF No. B01-059		Air Quality <input type="checkbox"/>		45 Days						
Ice Chest No. <b>SML-286</b>		Field Logbook No. EL-1518 - 1		COA B20TW2674C		Method of Shipment Fed Ex								
Shipped To <b>NSA 7/18/01 RECRA TMA/RECRA LIONVILLE</b>		Offsite Property No. <b>A010322</b>		Bill of Lading/Air Bill No. <b>423579546440</b>										
POSSIBLE SAMPLE HAZARDS/REMARKS  Special Handling and/or Storage				Preservation	HNO3 to pH <2	Cool 4C	H2SO4 to pH <2 Cool 4C	HCl or H2SO4 to pH <2 Cool	Cool 4C	HNO3 to pH <2				
				Type of Container	aG	aG	aG	aGs*	aG	aG				
				No. of Container(s)	1	1	1	3	2	2				
				Volume	500mL	500mL	500mL	40mL	1000mL	1000mL				
SAMPLE ANALYSIS				See item (1) in Special Instructions.	See item (2) in Special Instructions.	Ammonia - 350.3; NO2/NO3 - 353.1; TOC - 9060	VOA - 8260A (TCL)	Semi-VOA - 8270A (Add-On) (Tributyl phosphate)	Gross Alpha; Gross Beta					
Sample No.	Matrix *	Sample Date	Sample Time											
B12DB4	WATER	8/10/01	0300	X	X	X	X	X						
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS				Matrix *						
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		<p>** The ERC acknowledges that the analytical holding time for Nitrate by EPA Method 300.0 will not be met.</p> <p>(1) ICP Metals - 6010A (TAL) (Cadmium, Chromium, Copper, Nickel, Silver); ICP Metals - 6010A (Add-on) (Lead)</p> <p>(2) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate)</p> <p>Samples did not originate in radiological controlled area. No total activity associated with sample/samples.</p>		<p>S=Soil SB=Soil/Bottom SC=Solid SL=Sludge W=Water O=Oil A=Air DS=Drum Solid DL=Drum Liquid T=Therm W=Wipe L=Liquid V=Vegetation X=Other</p>				
Greg Thomas / M. J. ...		8/10/01		Ref 2C		8/10/01								
REF 2C		8/14/01 1000		S. I GALE		8/14/01 1000								
S. I GALE		8/14/01 1000		FED EX										
FED EX		8-15-01 0940		D. J. ...		8-15-01 0940								
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time								
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time								
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time								
LABORATORY SECTION		Received By		Title		Date/Time								
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time								

Lionville Laboratory, Inc.  
BNA ANALYTICAL DATA PACKAGE FOR  
TNUHANFORD B01-059 H1458

DATE RECEIVED: 08/15/01

LVL LOT # :0108L570

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B12DB4	001	W	01LE0961	08/10/01	08/16/01	08/21/01
B12DB4	001 MS	W	01LE0961	08/10/01	08/16/01	08/21/01
B12DB4	001 MSD	W	01LE0961	08/10/01	08/16/01	08/21/01

LAB QC:

SBLKDX	MB1	W	01LE0961	N/A	08/16/01	08/21/01
SBLKDX	MB1 BS	W	01LE0961	N/A	08/16/01	08/21/01



Client: TNU-HANFORD B01-059  
LVL #: 0108L570  
SDG/SAF #: H1458/B01-059

W.O. #: 11343-606-001-9999-00  
Date Received: 08-15-2001

## SEMIVOLATILE

One (1) water sample was collected on 08-10-2001.

The sample and its associated QC samples were extracted on 08-16-2001 and analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8270C for client specified Semivolatile target compound Tributylphosphate on 08-21-2001.


The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. The cooler temperature upon receipt has been recorded on the chain-of-custody.
2. The sample was extracted and analyzed within required holding times.
3. Six (6) of fifteen (15) surrogate recoveries were outside EPA QC limits. The surrogate recovery criteria were not met for samples B12DB4 MS and the blank spike (01LE0961-MB1 BS). It appears that the matrix spike analysis for sample B12DB4 was inadvertently not spiked with surrogate or spike compounds. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
4. Seven (7) of twelve (12) matrix spike recoveries were outside EPA QC limits.

Four (4) of six (6) blank spike recoveries were outside EPA QC limits.

The target compound is not included in the spiking solution. (CLP spike recoveries have been reported on the Form 3.)

5. Internal standard area and retention time criteria were met.
6. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

  
J. Michael Taylor  
President  
Lionville Laboratory Incorporated

9/10/01  
Date



som\gonup\data\bna\tnu-hanford-0108-570.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 10 pages.

# Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: DLMS 278

Initiator: Blaymer Batch: 01086570 Parameter: BVA  
 Date: 8-22-01 Samples: \_\_\_\_\_ Matrix: water  
 Client: TNL Hazard Method: SW846/MCAWW/CLP/ Prep Batch: 01LE0461

## 1. Reason for SDR

a. COC Discrepancy ☐ Tech Profile Error ☐ Client Request ☐ Sampler Error on C-O-C  
☐ Transcription Error ☐ Wrong Test Code ☐ Other \_\_\_\_\_

## b. General Discrepancy

☐ Missing Sample/Extract ☐ Container Broken ☐ Wrong Sample Pulled ☐ Label ID's Illegible  
☐ Hold Time Exceeded ☐ Insufficient Sample ☐ Preservation Wrong ☐ Received Past Hold  
☐ Improper Bottle Type ☐ Not Amenable to Analysis

Note\*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: \_\_\_\_\_

## c. Problem (Include all relevant specific results; attach data if necessary)

Matrix spike has no surrogates or spikes  
 BS, MSD have several low recoveries

## 2. Known or Probable Causes(s)

Another sample in this extraction batch appears to have been double spiked with both surrogates and spikes

## 3. Discussion and Proposed Action

Other Description:

☐ Re-log  
☐ Entire Batch  
☐ Following Samples: \_\_\_\_\_  
☒ Re-leach  
☒ Re-extract  
☐ Re-digest  
☐ Revise EDD  
☐ Change Test Code to \_\_\_\_\_  
☐ Place On/Take Off Hold (circle)

narrate

insufficient volume for  
 Re-extraction

## 4. Project Manager Instructions...signature/date:

☐ Concur with Proposed Action  
☐ Disagree with Proposed Action; See Instruction  
☒ Include in Case Narrative  
☐ Client Contacted:  
☐ Date/Person \_\_\_\_\_  
☐ Add  
☐ Cancel

*[Signature]* 8/24/01

## 5. Final Action...signature/date:

Other Explanation:

☐ Verified re-[log][leach][extract][digest][analysis] (circle)  
☒ Included in Case Narrative  
☐ Hard Copy COC Revised  
☐ Electronic COC Revised  
☐ EDD Corrections Completed

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

## Route Distribution of Completed SDR

☒ Initiator  
☒ Lab General Manager: M. Taylor  
☒ Project Mgr: Stone/Johnson/Haslett  
☒ Technical Mgr: Wesson/Daniels  
☒ QA (file): Alberts  
☐ Data Management: Feldman  
☐ Sample Prep: Beegle/Kiger

## Route Distribution of Completed SDR

☐ Metals: Beegle  
☐ Inorganic: Perrone  
☐ GC/LC: Kiger  
☐ MS: Rychlak/Layman  
☐ Log-in: Keppel  
☐ Admin: Soos  
☐ Other: \_\_\_\_\_

## GLOSSARY OF BNA DATA

### DATA QUALIFIERS

- U** = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
- J** = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B** = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
- E** = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- D** = Identifies all compounds identified in an analysis at a secondary dilution factor.
- I** = Interference.
- NQ** = Result qualitatively confirmed but not able to quantify.
- A** = Indicates that a TIC is a suspected aldol-condensation product.
- N** = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
- X** = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
- Y** = Additional qualifiers used as required are explained in the case narrative.

## GLOSSARY OF BNA DATA

### ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Suffix added to sample number to indicate that results are from a diluted analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
SP, Z	=	Indicates Spiked Compound.

## TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quantitation modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quantitation modifications:

- MP** - **Missed Peak:** manually added peak not found by automatic quantitation program.
- PA** - **Peak Assignment:** quantitation report was changed to reflect correct peak assignment.
- RI** - **Routine Integration:** routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.
- SP** - **Split Peak:** the automatic integration improperly split the peak; a manual integration was performed to get the correct area.
- CB** - **Coelution/Background:** peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.
- PI** - **Proper Integration:** a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.



## WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Lionville Labs, Inc.Contract: 1343-06-01Case No.: TNUHANFORD B01-059 H1458RFW Lot No.: 0108L570-001MATRIX Spike - Sample No.: B12DB4Level: (low/med) LOW

COMPOUND	SPIKE ADDED UG/L	SAMPLE CONCENTRATION UG/L	MS CONCENTRATION UG/L	MS % REC #	QC LIMITS REC
1,4-Dichlorobenzene_____	104	0	0	0 *	36 -97
N-Nitroso-Di-n-propylamine_____	104	0	0	0 *	41 -116
1,2,4-Trichlorobenzene_____	104	0	0	0 *	39 -98
Acenaphthene_____	104	0	0	0 *	46 -118
2,4-Dinitrotoluene_____	104	0	0	0 *	24 -96
Pyrene_____	104	0	0	0 *	26 -127

COMPOUND	SPIKE ADDED UG/L	MSD CONCENTRATION UG/L	MSD % REC #	% RPD #	QC LIMITS RPD   REC
1,4-Dichlorobenzene_____	106	36.8	35 *	205 *	28   36 -97
N-Nitroso-Di-n-propylamine_____	106	54.5	51	204 *	38   41 -116
1,2,4-Trichlorobenzene_____	106	40.8	39	205 *	28   39 -98
Acenaphthene_____	106	53.8	51	204 *	31   46 -118
2,4-Dinitrotoluene_____	106	66.3	63	203 *	38   24 -96
Pyrene_____	106	76.2	72	200 *	31   26 -127

# Column to be used to flag recovery and RPD values with an asterisk

\* Values outside of QC limits

RPD: 6 out of 6 outside limitsSpike Recovery: 7 out of 12 outside limits

COMMENTS:

3C  
WATER SEMIVOLATILE BLANK SPIKE RECOVERY

Lab Name: Lionville Labs, Inc.

Contract: 1343-06-01

Case No.: TNUHANFORD B01-059 H1458

RFW Lot No.: 0108L570

BLANK Spike - Sample No.: SBLKDXLE0961-MB1

Level: (low/med) LOW

COMPOUND	SPIKE ADDED UG/L	SAMPLE CONCENTRATION UG/L	BS CONCENTRATION UG/L	BS % REC #	QC LIMITS REC
1,4-Dichlorobenzene	50.0	0	11.7	23 *	36 -97
N-Nitroso-Di-n-propylamine	50.0	0	18.9	38 *	41 -116
1,2,4-Trichlorobenzene	50.0	0	12.5	25 *	39 -98
Acenaphthene	50.0	0	18.3	37 *	46 -118
2,4-Dinitrotoluene	50.0	0	24.2	48	24 -96
Pyrene	50.0	0	28.5	57	26 -127

# Column to be used to flag recovery value with an asterisk

\* Values outside of QC limits

Spike Recovery: 4 out of 6 outside limits

COMMENTS:



6108L570

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client <u>TNU-Hanford B01-059</u>	Refrigerator #	A	C	D	E	F	G	H
Est. Final Proj. Sampling Date	#/Type Container	Liquid	3Ag	2Ag			1Ag	1Ag
Project # <u>11343-6060-001-9999-00</u>	Solid							
Project Contact/Phone #	Volume	Liquid	40	1L			500	500
Lionville Laboratory Project Manager <u>OJ</u>	Solid							
QC <u>Spec</u> Del <u>Std</u> TAT <u>30 day</u>	Preservatives		100	100			100	100
Date Rec'd <u>8-15-01</u> Date Due <u>9-14-01</u>	ANALYSES REQUESTED	ORGANIC			INORG			
	VOA	BNA	Pest/PCB	Herb				

MATRIX CODES: S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids L - EP/TCLP Leachate Wt - Wipe X - Other F - Fish	Lab ID	Client ID/Description	Matrix QC Chosen (✓)		Matrix	Date Collected	Time Collected	Lionville Laboratory Use Only																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
			MS	MSD				H 4200	X 5200						M 10		O 21	C 2001 UH T	I 2001 T																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	001	B12DB4	X	X	W	8/10/01	0300	X	X							X		X	X																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							

Special Instructions: Sof B01-059

## DATE/REVISIONS:

Met 1. Cd, Cr, Cu, Ni, Ag, Pb  
 IC 2. TCE, ICFL, ICNO3, ICNO2, ICRA, ICSTH  
 3. \_\_\_\_\_  
 4. \_\_\_\_\_  
 5. \_\_\_\_\_  
 6. \_\_\_\_\_

## Lionville Laboratory Use Only

Samples were:  
 1) Shipped ☒ or  
 Hand Delivered \_\_\_\_\_  
 Airbill # 12357954 6440  
 2) Ambient or Chilled ☒  
 3) Received in Good Condition ☒ or N  
 4) Samples Properly Preserved ☒ or N  
 5) Received Within 2 Holding Times ☒ or N  
 Tamper Resistant Seal was:  
 1) Present on Outer Package ☒ or N  
 2) Unbroken on Outer Package ☒ or N  
 3) Present on Sample ☒ or N  
 4) Unbroken on Sample ☒ or N  
 COC Record Present Upon Sample Rec't ☒ or N  
 Cooler Temp. 20 °C

Relinquished by	Received by	Date	Time
<u>GeoEx</u>	<u>D. J. J. J.</u>	<u>8/15/01</u>	<u>0940</u>

Relinquished by	Received by	Date	Time

Discrepancies Between Samples Labels and COC Record? Y or N  
 NOTES:

COMPOSITE WASTE

ORIGINAL

TR 815-1

21

<b>Bechtel Hanford Inc.</b>		<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b>						<b>B01-059-009</b>		Page 1 of 1	
Collector Thomas, G/Watson, D.		Company Contact Todd, M.		Telephone No. (509)372-9631		Project Coordinator TRENT, SJ		Price Code 7N		Data Turnaround 45 Days	
Project Designation 200-TW-1 & 2 - QC Sampling		Sampling Location T-26/200 W		SAF No. B01-059		Air Quality <input type="checkbox"/>					
Ice Chest No. <b>SML-286</b>		Field Logbook No. EL-1518 - 1		COA B20TW2674C		Method of Shipment Fed Ex					
Shipped To <b>DSA 7/18/01 RECREATION AREA LIONVILLE</b>		Offsite Property No. <b>A010322</b>				Bill of Lading/Air Bill No. <b>423579546440</b>					
POSSIBLE SAMPLE HAZARDS/REMARKS  Special Handling and/or Storage			Preservation	HNO3 to pH <2	Cool 4C	H2SO4 to pH <2 Cool 4C	HCl or H2SO4 to pH <2 Cool	Cool 4C	HNO3 to pH <2		
			Type of Container	aG	aG	aG	aGs*	aG	aG		
			No. of Container(s)	1	1	1	3	2	2		
			Volume	500mL	500mL	500mL	40mL	1000mL	1000mL		
SAMPLE ANALYSIS				See item (1) in Special Instructions.	See item (2) in Special Instructions.	Ammonia - 350.3; NO2/NO3 - 353.1; TOC - 9060	VOA - 8260A (TCL)	Semi-VOA - 8270A (Add-On) (Tributyl phosphate)	Gross Alpha; Gross Beta		
Sample No.	Matrix *	Sample Date	Sample Time								
B12DB4	WATER	8/10/01	0300	X	X	X	X	X			
<b>CHAIN OF POSSESSION</b>				<b>Sign/Print Names</b>				<b>SPECIAL INSTRUCTIONS</b> ** The ERC acknowledges that the analytical holding time for Nitrate by EPA Method 300.0 will not be met.  (1) ICP Metals - 6010A (TAL) (Cadmium, Chromium, Copper, Nickel, Silver); ICP Metals - 6010A (Add-on) {Lead} (2) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate) <b>Samples did not originate in radiological controlled area. No total activity associated with sample/samples.</b>			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
<i>Greg Thomas</i>		8/9/01		<i>Ref 2C</i>		8/10/01					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
<i>REF 2C</i>		8/14/01 1000		<i>S. J. GALE</i>		8/14/01 1000					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
<i>S. J. GALE</i>		8/14/01 1000		<i>FED EX</i>							
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
<i>FED EX</i>		8-15-01 0940		<i>D. J. ...</i>		8-15-01 0940					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
<b>LABORATORY SECTION</b>		Received By		Title				Date/Time			
<b>FINAL SAMPLE DISPOSITION</b>		Disposal Method		Disposed By				Date/Time			

Lionville Laboratory, Inc.  
INORGANIC ANALYTICAL DATA PACKAGE FOR  
TNUHANFORD B01-059 H1458

DATE RECEIVED: 08/15/01

LVL LOT # :0108L570

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B12DB4						
SILVER, TOTAL	001	W	01L0548	08/10/01	08/31/01	09/02/01
SILVER, TOTAL	001 REP	W	01L0548	08/10/01	08/31/01	09/02/01
SILVER, TOTAL	001 MS	W	01L0548	08/10/01	08/31/01	09/02/01
CADMIUM, TOTAL	001	W	01L0548	08/10/01	08/31/01	09/02/01
CADMIUM, TOTAL	001 REP	W	01L0548	08/10/01	08/31/01	09/02/01
CADMIUM, TOTAL	001 MS	W	01L0548	08/10/01	08/31/01	09/02/01
CHROMIUM, TOTAL	001	W	01L0548	08/10/01	08/31/01	09/02/01
CHROMIUM, TOTAL	001 REP	W	01L0548	08/10/01	08/31/01	09/02/01
CHROMIUM, TOTAL	001 MS	W	01L0548	08/10/01	08/31/01	09/02/01
COPPER, TOTAL	001	W	01L0548	08/10/01	08/31/01	09/02/01
COPPER, TOTAL	001 REP	W	01L0548	08/10/01	08/31/01	09/02/01
COPPER, TOTAL	001 MS	W	01L0548	08/10/01	08/31/01	09/02/01
NICKEL, TOTAL	001	W	01L0548	08/10/01	08/31/01	09/02/01
NICKEL, TOTAL	001 REP	W	01L0548	08/10/01	08/31/01	09/02/01
NICKEL, TOTAL	001 MS	W	01L0548	08/10/01	08/31/01	09/02/01
LEAD, TOTAL	001	W	01L0548	08/10/01	08/31/01	09/02/01
LEAD, TOTAL	001 REP	W	01L0548	08/10/01	08/31/01	09/02/01
LEAD, TOTAL	001 MS	W	01L0548	08/10/01	08/31/01	09/02/01

LAB QC:

SILVER LABORATORY	LC1 BS	W	01L0548	N/A	08/31/01	09/02/01
SILVER, TOTAL	MB1	W	01L0548	N/A	08/31/01	09/02/01
CADMIUM LABORATORY	LC1 BS	W	01L0548	N/A	08/31/01	09/02/01
CADMIUM, TOTAL	MB1	W	01L0548	N/A	08/31/01	09/02/01
CHROMIUM LABORATORY	LC1 BS	W	01L0548	N/A	08/31/01	09/02/01
CHROMIUM, TOTAL	MB1	W	01L0548	N/A	08/31/01	09/02/01
COPPER LABORATORY	LC1 BS	W	01L0548	N/A	08/31/01	09/02/01
COPPER, TOTAL	MB1	W	01L0548	N/A	08/31/01	09/02/01
NICKEL LABORATORY	LC1 BS	W	01L0548	N/A	08/31/01	09/02/01
NICKEL, TOTAL	MB1	W	01L0548	N/A	08/31/01	09/02/01
LEAD LABORATORY	LC1 BS	W	01L0548	N/A	08/31/01	09/02/01
LEAD, TOTAL	MB1	W	01L0548	N/A	08/31/01	09/02/01



## Analytical Report

**Client:** TNU-HANFORD B01-059  
**LVL#:** 0108L570  
**SDG/SAF#:** H1458/B01-059

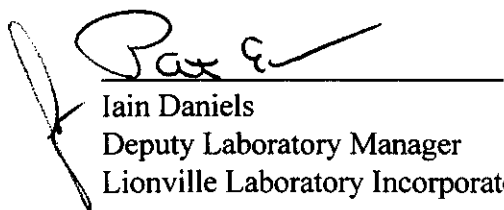
**W.O.#:** 11343-606-001-9999-00  
**Date Received:** 08-15-01

### METALS CASE NARRATIVE

1. This narrative covers the analysis of 1 water sample.
2. The sample was prepared and analyzed in accordance with methods checked on the attached glossary.
3. All analyses were performed within the required holding times.
4. The cooler temperature has been recorded on the Chain of Custody.
5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.
6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).
8. All ICP Interference Check Standards were within control limits.
9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.
10. All matrix spike (MS) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.
11. The duplicate analyses for 3 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.
12. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 12 pages.

13. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

  
Iain Daniels  
Deputy Laboratory Manager  
Lionville Laboratory Incorporated  
gmb/m08-570

09-17-01  
Date

# METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this

Recra Lot#: 0108LS70

Leaching Procedure: 1310 1311 1312 Other:

CLP Metals Digestion and Analysis Methods: ILM03.0 ILM04.0

Metals Digestion Methods: 3005A 3010A 3015 3020A 3050B 3051 200.7 SS17  
Other:

## Metals Analysis Methods

	SW846	EPA	STD MTD	EPA OSWR	USATHAMA
Aluminum	6010B	200.7			99
Antimony	6010B 7041 <sup>s</sup>	200.7 204.2			99
Arsenic	6010B 7060A <sup>s</sup>	200.7 206.2	3113B		99
Barium	6010B	200.7			99
Beryllium	6010B	200.7			99
Bismuth	6010B <sup>1</sup>	200.7 <sup>1</sup>		1620	99
Boron	6010B	200.7			99
Cadmium	6010B 7131A <sup>s</sup>	200.7 213.2			99
Calcium	6010B	200.7			99
Chromium	6010B 7191 <sup>s</sup>	200.7 218.2			SS17
Cobalt	6010B	200.7			99
Copper	6010B 7211 <sup>s</sup>	200.7 220.2			99
Iron	6010B	200.7			99
Lead	6010B 7421 <sup>s</sup>	200.7 239.2	3113B		99
Lithium	6010B 7430 <sup>4</sup>	200.7		1620	99
Magnesium	6010B	200.7			99
Manganese	6010B	200.7			99
Mercury	7470A <sup>3</sup> 7471A <sup>3</sup>	245.1 <sup>2</sup> 245.5 <sup>2</sup>			99
Molybdenum	6010B	200.7			99
Nickel	6010B	200.7			99
Potassium	6010B 7610 <sup>4</sup>	200.7 258.1 <sup>4</sup>			99
Rare Earths	6010B <sup>1</sup>	200.7 <sup>1</sup>		1620	99
Selenium	6010B 7740 <sup>s</sup>	200.7 270.2	3113B		99
Silicon	6010B <sup>1</sup>	200.7		1620	99
Silica	6010B	200.7		1620	99
Silver	6010B 7761 <sup>s</sup>	200.7 272.2			99
Sodium	6010B 7770 <sup>4</sup>	200.7 273.1 <sup>4</sup>			99
Strontium	6010B	200.7			99
Thallium	6010B 7841 <sup>s</sup>	200.7 279.2 200.9			99
Tin	6010B	200.7			99
Titanium	6010B	200.7			99
Uranium	6010B <sup>1</sup>	200.7 <sup>1</sup>		1620	99
Vanadium	6010B	200.7			99
Zinc	6010B	200.7			99
Zirconium	6010B <sup>1</sup>	200.7 <sup>1</sup>		1620	99

Other:

Method:

# **METHOD REFERENCES AND DATA QUALIFIERS**

## **DATA QUALIFIERS**

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

\* = Indicates that the original sample result is greater than 4x the spike amount added.

## **ABBREVIATIONS**

MB = Method or Preparation Blank.

MS = Matrix Spike.

MSD = Matrix Spike Duplicate.

REP = Sample Replicate

LCS = Laboratory Control Sample.

NC = Not calculated.

## **ANALYTICAL METAL METHODS**

1. Not included in the method element list.
2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, 0.1 grams of sample is taken to a final volume of 50 mL (including all reagents).
3. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, three 0.1 gram of sample is taken to a final volume of 50 mL (including all reagents).
4. Flame AA.
5. Graphite Furnace AA.

RFW 21-21L-033/N-10/96

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/17/01

CLIENT: TNUHANFORD B01-059 H1458

LVL LOT #: 0108L570

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-----	-----	-----	-----	-----	-----	-----
-001	B12DB4	Silver, Total	0.53	UG/L	0.50	1.0
		Cadmium, Total	0.45	UG/L	0.30	1.0
		Chromium, Total	8.5	UG/L	1.4	1.0
		Copper, Total	0.74	UG/L	0.50	1.0
		Nickel, Total	4.0	UG/L	1.7	1.0
		Lead, Total	2.4 u	UG/L	2.4	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 09/17/01

CLIENT: TNUHANFORD B01-059 H1458  
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0108L570

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
*****	*****	*****	*****	*****	*****	*****
BLANK1	01L0548-MB1	Silver, Total	0.50 u	UG/L	0.50	1.0
		Cadmium, Total	0.30 u	UG/L	0.30	1.0
		Chromium, Total	1.4 u	UG/L	1.4	1.0
		Copper, Total	0.66	UG/L	0.50	1.0
		Nickel, Total	1.7 u	UG/L	1.7	1.0
		Lead, Total	2.4 u	UG/L	2.4	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 09/17/01

CLIENT: TNUHANFORD B01-059 H1458

LVL LOT #: 0108L570

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
*****	*****	*****	*****	*****	*****	*****	*****
-001	B12DB4	Silver, Total	50.6	0.53	50.0	100.1	1.0
		Cadmium, Total	48.9	0.45	50.0	96.9	1.0
		Chromium, Total	198	8.5	200	94.7	1.0
		Copper, Total	255	0.74	250	101.6	1.0
		Nickel, Total	498	4.0	500	98.9	1.0
		Lead, Total	496	2.4 u	500	99.2	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 09/17/01

CLIENT: TNUHANFORD B01-059 H1458  
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0108L570

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-001REP	B12DB4	Silver, Total	0.53	0.50u	NC 200	1.0
		Cadmium, Total	0.45	0.30u	NC 200	1.0
		Chromium, Total	8.5	6.9	20.8	1.0
		Copper, Total	0.74	0.72	2.7	1.0
		Nickel, Total	4.0	3.3	19.2	1.0
		Lead, Total	2.4 u	2.4 u	NC	1.0

7/3 9/17/01

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 09/17/01

CLIENT: TNUHANFORD B01-059 H1458  
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0108L570

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
*****	*****	*****	*****	*****	*****	*****
LCS1	01L0548-LC1	Silver, LCS	493	500	UG/L	98.7
		Cadmium, LCS	250	250	UG/L	100
		Chromium, LCS	498	500	UG/L	99.5
		Copper, LCS	1260	1250	UG/L	100.9
		Nickel, LCS	2010	2000	UG/L	100.6
		Lead, LCS	2500	2500	UG/L	100.1

**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

Special Instructions: Sgs BM-059

**DATE/REVISIONS:**

metals : Cd, Cr, Cu, Ni, Ag, Pb

IC① 2. IC1, ICF1, ICno3, ICno2, ICPh4, ICS04

3

4

5

8

Lionville Laboratory Use Only

**Samples were:**

1) Shipped ☒ or  
Hand Delivered ☐

Airbnb #

62-357954-6440

2) Ambient or Chilled

3) Received in Good Condition ☒ or N

4) Samples Properly Preserved

Property Preserved  
T or N

5) Received Within 7

### Holding Times

**Tamper Resistant Seal was:**

1) Present on Outer  
Package (Y) or N

2) Unbroken on Outer  
Package ☒ or N

3) Present on Sample ☒ or N

4) Unbroken on

Sample 9 or N  
COC Record Present

Upon Sample Rec? Y or N

Cooler Temp. 20 °C

Relinquished by	Received by	Date	Time
COMPOSITE		ORIGINAL	

Discrepancies Between  
Samples Labels and  
COC Record? Y or ☒ N

## COMPOSITE

**ORIGINAL**

<b>Bechtel Hanford Inc.</b>		<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b>					<b>B01-059-009</b>		Page 1 of 1		
Collector Thomas, G/Watson, D.		Company Contact Todd, M.		Telephone No. (509)372-9631		Project Coordinator TRENT, SJ		Price Code 7N		Data Turnaround 45 Days	
Project Designation 200-TW-1 & 2 - QC Sampling		Sampling Location T-26/200 W		SAF No. B01-059		Air Quality <input type="checkbox"/>					
Ice Chest No. SML-286		Field Logbook No. EL-1518 - 1		COA B20TW2674C		Method of Shipment Fed Ex					
Shipped To <del>DSA</del> 7/18/01 RECRA <del>TMAR/BORA</del> LIONVILLE		Offsite Property No. A010322				Bill of Lading/Air Bill No. 423579546440					
POSSIBLE SAMPLE HAZARDS/REMARKS  Special Handling and/or Storage			Preservation	HNO3 to pH < 2	Cool AC	H2SO4 to pH < 2 Cool AC	HCl or H2SO4 to pH < 2 Cool	Cool AC	HNO3 to pH < 2		
			Type of Container	aG	aG	aG	aGs*	aG	aG		
			No. of Container(s)	1	1	1	3	2	2		
			Volume	500mL	500mL	500mL	40mL	1000mL	1000mL		
SAMPLE ANALYSIS			See item (1) in Special Instructions.	See item (2) in Special Instructions.	Ammonia - 350.3; NO2/NO3 - 353.1; TOC - 9060	VOA - 8260A (TCL)	Semi-VOA - 8270A (Add-On) (Tributyl phosphate)	Cross Alpha; Gross Beta	DSA 7/18/01		
Sample No.	Matrix *	Sample Date	Sample Time								
B12DB4	WATER	8/10/01	0300	X	X	X	X	X			
<b>CHAIN OF POSSESSION</b>				<b>SPECIAL INSTRUCTIONS</b>				<b>Matrix *</b>			
Relinquished By/Removed From Greg Jones 8/10/01		Date/Time 8/10/01		Received By/Stored In Ref 2C		Date/Time 8/10/01		** The ERC acknowledges that the analytical holding time for Nitrate by EPA Method 300.0 will not be met.  (1) ICP Metals - 6010A (TAL) (Cadmium, Chromium, Copper, Nickel, Silver); ICP Metals - 6010A (Add-on) (Lead) (2) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate) Samples did not originate in radiological controlled area. No total activity associated with sample/samples.			
Relinquished By/Removed From REF 2C 81401 1000		Date/Time 8/10/01		Received By/Stored In S. J. GALE 8/10/01		Date/Time 8/10/01					
Relinquished By/Removed From S. J. GALE 81401 1000		Date/Time 8/10/01		Received By/Stored In FED EX		Date/Time					
Relinquished By/Removed From Fed Ex 8-15-01 0940		Date/Time 8-15-01 0940		Received By/Stored In D. J. JAMES		Date/Time 8-15-01 0940					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
LABORATORY SECTION		Received By		Title		Date/Time					
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time					

Lionville Laboratory, Inc.  
INORGANIC ANALYTICAL DATA PACKAGE FOR  
TNUHANFORD B01-059 H1458

DATE RECEIVED: 08/15/01

LVL LOT # :0108L570

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B12DB4						
CHLORIDE BY IC	001	W	01LICC55	08/10/01	08/22/01	08/22/01
CHLORIDE BY IC	001 REP	W	01LICC55	08/10/01	08/22/01	08/22/01
CHLORIDE BY IC	001 MS	W	01LICC55	08/10/01	08/22/01	08/22/01
FLUORIDE BY IC	001	W	01LICC55	08/10/01	08/22/01	08/22/01
FLUORIDE BY IC	001 REP	W	01LICC55	08/10/01	08/22/01	08/22/01
FLUORIDE BY IC	001 MS	W	01LICC55	08/10/01	08/22/01	08/22/01
NITRITE BY IC	001	W	01LICC55	08/10/01	08/22/01	08/22/01
NITRITE BY IC	001 REP	W	01LICC55	08/10/01	08/22/01	08/22/01
NITRITE BY IC	001 MS	W	01LICC55	08/10/01	08/22/01	08/22/01
NITRATE BY IC	001	W	01LICC55	08/10/01	08/22/01	08/22/01
NITRATE BY IC	001 REP	W	01LICC55	08/10/01	08/22/01	08/22/01
NITRATE BY IC	001 MS	W	01LICC55	08/10/01	08/22/01	08/22/01
PHOSPHATE BY IC	001	W	01LICC55	08/10/01	08/22/01	08/22/01
PHOSPHATE BY IC	001 REP	W	01LICC55	08/10/01	08/22/01	08/22/01
PHOSPHATE BY IC	001 MS	W	01LICC55	08/10/01	08/22/01	08/22/01
SULFATE BY IC	001	W	01LICC55	08/10/01	08/22/01	08/22/01
SULFATE BY IC	001 REP	W	01LICC55	08/10/01	08/22/01	08/22/01
SULFATE BY IC	001 MS	W	01LICC55	08/10/01	08/22/01	08/22/01
NITRATE NITRITE	001	W	01LN3A44	08/10/01	08/22/01	08/22/01
NITRATE NITRITE	001 REP	W	01LN3A44	08/10/01	08/22/01	08/22/01
NITRATE NITRITE	001 MS	W	01LN3A44	08/10/01	08/22/01	08/22/01
AMMONIA	001	W	01LAM040	08/10/01	08/24/01	08/24/01
AMMONIA	001 REP	W	01LAM040	08/10/01	08/24/01	08/24/01
AMMONIA	001 MS	W	01LAM040	08/10/01	08/24/01	08/24/01
TOTAL ORGANIC CARBON	001	W	01LTCA43	08/10/01	09/04/01	09/04/01
TOTAL ORGANIC CARBON	001 REP	W	01LTCA43	08/10/01	09/04/01	09/04/01
TOTAL ORGANIC CARBON	001 MS	W	01LTCA43	08/10/01	09/04/01	09/04/01

LAB QC:

CHLORIDE BY IC	MB1	W	01LICC55	N/A	08/22/01	08/22/01
CHLORIDE BY IC	MB1 BS	W	01LICC55	N/A	08/22/01	08/22/01
FLUORIDE BY IC	MB1	W	01LICC55	N/A	08/22/01	08/22/01
FLUORIDE BY IC	MB1 BS	W	01LICC55	N/A	08/22/01	08/22/01
NITRITE BY IC	MB1	W	01LICC55	N/A	08/22/01	08/22/01

Lionville Laboratory, Inc.  
INORGANIC ANALYTICAL DATA PACKAGE FOR  
TNUHANFORD B01-059 H1458

DATE RECEIVED: 08/15/01

LVL LOT # :0108L570

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
NITRITE BY IC	MB1 BS	W	01LIC55	N/A	08/22/01	08/22/01
NITRATE BY IC	MB1	W	01LIC55	N/A	08/22/01	08/22/01
NITRATE BY IC	MB1 BS	W	01LIC55	N/A	08/22/01	08/22/01
PHOSPHATE BY IC	MB1	W	01LIC55	N/A	08/22/01	08/22/01
PHOSPHATE BY IC	MB1 BS	W	01LIC55	N/A	08/22/01	08/22/01
SULFATE BY IC	MB1	W	01LIC55	N/A	08/22/01	08/22/01
SULFATE BY IC	MB1 BS	W	01LIC55	N/A	08/22/01	08/22/01
NITRATE NITRITE	MB1	W	01LN3A44	N/A	08/22/01	08/22/01
NITRATE NITRITE	MB1 BS	W	01LN3A44	N/A	08/22/01	08/22/01
AMMONIA	MB1	W	01LAM040	N/A	08/24/01	08/24/01
AMMONIA	MB1 BS	W	01LAM040	N/A	08/24/01	08/24/01
AMMONIA	MB1 BSD	W	01LAM040	N/A	08/24/01	08/24/01
TOTAL ORGANIC CARBON	MB1	W	01LTCA43	N/A	09/04/01	09/04/01
TOTAL ORGANIC CARBON	MB1 BS	W	01LTCA43	N/A	09/04/01	09/04/01



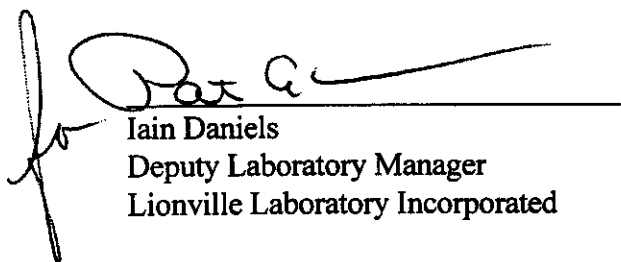
## Analytical Report

**Client:** TNU-HANFORD B01-059 H1458  
**LVL#:** 0108L570

**W.O.#:** 11343-606-001-9999-00  
**Date Received:** 08-15-01

### INORGANIC NARRATIVE

1. This narrative covers the analyses of 1 water sample.
2. The sample was prepared and analyzed in accordance with the methods checked on the attached glossary.
3. Sample holding times as required by the method and/or contract were met with the exception of Nitrate, Nitrite and Phosphate that were received past hold.
4. The cooler temperature was recorded on the chain of custody.
5. The method blanks were within the method criteria.
6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS for Ammonia was within the 20% Relative Percent Difference (RPD) control limit.
7. The matrix spike recoveries were within the 75-125% control limits.
8. The replicate analyses were within the 20% RPD control limit.
9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

  
Iain Daniels  
Deputy Laboratory Manager  
Lionville Laboratory Incorporated

09-13-01  
Date

njp\08-570

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 13 pages.

# Lionville Laboratory Incorporated

## WET CHEMISTRY

### METHODS GLOSSARY FOR WATER SAMPLE ANALYSIS

	<u>EPA /600</u>	<u>SW846</u>	<u>OTHER</u>
Acidity	305.1		
___Alkalinity ___Bicarbonate ___Carbonate	310.1		
BOD	405.1		___ 5210B (b)
Ion Chromatography:			
___Bromide ___Chloride <input checked="" type="checkbox"/> Fluoride	<input checked="" type="checkbox"/> 300.0	___ 9056	
<input checked="" type="checkbox"/> Nitrate <input checked="" type="checkbox"/> Nitrite <input checked="" type="checkbox"/> Phosphate	<input checked="" type="checkbox"/> 300.0	___ 9056	
<input checked="" type="checkbox"/> Sulfate ___Formate ___Acetate ___Oxalate	<input checked="" type="checkbox"/> 300.0	___ 9056	
Chloride	325.2	___ 9251	
Chlorine, Residual	330.5 (mod)		
Cyanide, Amenable to Chlorination	335.2	___ 9010B	
Cyanide, Total	335.2	___ 9010B	___ 9014 ___ ILMO4.0 (e)
Cyanide, Weak Acid Dissociable			___ 412 (a) ___ 4500CN-I (C)
COD	410.4(mod)		___ 5220C (b)
Color	110.2		
Corrosivity by Coupon		___ 1110(mod)	
Chromium VI		___ 7196A	___ 3500Cr-D (b)
Fluoride	340.2		___ 4500-FC
Hardness, Calcium	215.2		
Hardness, Total	130.2		
Iodide			___ ASTM D19P202 (1)
Surfactant	425.1		
<input checked="" type="checkbox"/> Nitrate-Nitrite ___Nitrate ___Nitrite	<input checked="" type="checkbox"/> 353.2		
Ammonia	350.3		
Total ___Kjeldahl ___Organic Nitrogen	351.3		
Total <input checked="" type="checkbox"/> Organic ___Inorganic Carbon	415.1	<input checked="" type="checkbox"/> 9060	
Oil & Grease	413.1	___ 9070	
pH ___pH; paper	150.1	___ 9040B ___ 9041A	
Petroleum Hydrocarbons, Total Recoverable	418.1		
Phenol	420.1	___ 420.2 ___ 9065 ___ 9066	
___Ortho ___Total Phosphate	365.2		___ 4500-P B ___ C
Salinity			___ 210A (a) ___ 2520 (b)
Settleable Solids	160.5		
Sulfide	376.1		___ 9030B/9034 (acid soluble)
Reactive ___Cyanide ___Sulfide		___ Section 7.3 (___9014___9030B)	
Silica	370.1		
Sulfite	377.1		
Sulfate	375.4	___ 9038	
Specific Conductance	120.1	___ 9050A	
Specific Gravity			___ D5057-90 ___ 213E (a)
Synthetic Precipitation Leach		1312	
Total ___Dissolved ___Suspended ___Solids	160 ___1 ___2 ___3		
Total Organic Halides	450.1	___ 9020B	
Turbidity	180.1		
Volatile Solids:			
___Total ___Dissolved ___Suspended	160.4		
Other:		Method:	

## Lionville Laboratory Incorporated

# METHOD REFERENCES AND DATA QUALIFIERS

### DATA QUALIFIERS

- U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.
- \* = Indicates that the original sample result is greater than 4x the spike amount added.

### ABBREVIATIONS

- MB = Method or Preparation Blank.  
MS = Matrix Spike.  
MSD = Matrix Spike Duplicate.  
REP = Sample Replicate  
LC = Laboratory Control Sample.  
NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

### ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.
2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).
3. Test Methods for Evaluating Solid Waste (USEPA SW-846).
  - a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).
  - b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).
  - c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).
  - d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).
  - e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.
  - f. Code of Federal Regulations.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/05/01

CLIENT: TNUHANFORD B01-059 H1458  
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0108L570

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
=====	=====	=====	=====	=====	=====	=====
-001	B12DB4	Chloride by IC	0.25 u	MG/L	0.25	1.0
		Fluoride by IC	0.50 u	MG/L	0.50	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	0.40	MG/L	0.25	1.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	0.25	MG/L	0.25	1.0
		Nitrate Nitrite	0.10	MG/L	0.020	1.0
		Ammonia, as N	0.10 u	MG/L	0.10	1.0
		Total Organic Carbon	0.50 u	MG/L	0.50	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 09/05/01

CLIENT: TNUHANFORD B01-059 H1458  
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0108L570

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-----	-----	-----	-----	-----	-----	-----
BLANK10	01LIC55-MB1	Chloride by IC	0.25 u	MG/L	0.25	1.0
		Fluoride by IC	0.50 u	MG/L	0.50	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	0.25 u	MG/L	0.25	1.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	0.25 u	MG/L	0.25	1.0
BLANK10	01LN3A44-MB1	Nitrate Nitrite	0.020u	MG/L	0.020	1.0
BLANK10	01LAM040-MB1	Ammonia, as N	0.10 u	MG/L	0.10	1.0
BLANK10	01LTCA43-MB1	Total Organic Carbon	0.50 u	MG/L	0.50	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 09/05/01

CLIENT: TNUHANFORD B01-059 H1458

LVL LOT #: 0108L570

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-----	-----	-----	-----	-----	-----	-----	-----
-001	B12DB4	Chloride by IC	5.1	0.16	5.0	98.2	1.0
		Fluoride by IC	10.7	0.00	10.0	107.2	1.0
		Nitrite by IC	4.96	0.25u	5.00	99.2	1.0
		Nitrate by IC	5.23	0.40	5.00	96.6	1.0
		Phosphate by IC	4.8	0.25u	5.0	96.8	1.0
		Sulfate by IC	5.0	0.26	5.0	95.7	1.0
		Nitrate Nitrite	0.58	0.10	0.50	95.6	1.0
		Ammonia, as N	2.0	0.10u	2.0	101.5	1.0
		Total Organic Carbon	5.9	0.44	5.0	110.2	1.0
BLANK10	01LIC55-MB1	Chloride by IC	4.8	0.25u	5.0	95.1	1.0
		Fluoride by IC	10.8	0.50u	10.0	107.6	1.0
		Nitrite by IC	4.83	0.25u	5.00	96.6	1.0
		Nitrate by IC	5.02	0.25u	5.00	100.5	1.0
		Phosphate by IC	5.1	0.25u	5.0	102.3	1.0
		Sulfate by IC	4.9	0.25u	5.0	97.5	1.0
BLANK10	01LN3A44-MB1	Nitrate Nitrite	0.50	0.02u	0.50	100.8	1.0
BLANK10	01LAM040-MB1	Ammonia, as N	2.0	0.10u	2.0	98.5	1.0
		Ammonia, as N MSD	2.0	0.10u	2.0	100	1.0
BLANK10	01LTCA43-MB1	Total Organic Carbon	5.2	0.50u	5.0	104.0	1.0

Lionville Laboratory, Inc.

INORGANICS DUPLICATE SPIKE REPORT 09/05/01

CLIENT: TNUHANFORD B01-059 H1458  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0108L570

SAMPLE	SITE ID	ANALYTE	SPIKE#1	SPIKE#2	%DIFF
			%RECOV	%RECOV	
BLANK10	01LAM040-MB1	Ammonia, as N	98.5	100	1.5

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 09/05/01

CLIENT: TNUHANFORD B01-059 H1458  
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0108L570

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
*****	*****	*****	*****	*****	*****	*****
-001REP	B12DB4	Chloride by IC	0.25u	0.25u	NC	1.0
		Fluoride by IC	0.50u	0.50u	NC	1.0
		Nitrite by IC	0.25u	0.25u	NC	1.0
		Nitrate by IC	0.40	0.40	0.25	1.0
		Phosphate by IC	0.25u	0.25u	NC	1.0
		Sulfate by IC	0.26	0.25u	NC	1.0
		Nitrate Nitrite	0.10	0.099	1.0	1.0
		Ammonia, as N	0.10u	0.10u	NC	1.0
		Total Organic Carbon	0.50u	0.50u	NC	1.0

**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

~~ORIGINAL~~

<b>Bechtel Hanford Inc.</b>				<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b>					<b>B01-059-009</b>		<b>Page 1 of 1</b>		
Collector Thomas, G/Watson, D.				Company Contact Todd, M.		Telephone No. (509)372-9631		Project Coordinator TRENT, SJ		Price Code <b>7N</b>		Data Turnaround <b>45 Days</b>	
Project Designation 200-TW-1 & 2 - QC Sampling				Sampling Location T-26/200 W		SAF No. B01-059		Method of Shipment Fed Ex		Air Quality <input type="checkbox"/>			
Ice Chest No. <b>SML-286</b>				Field Logbook No. EL-1518 - 1		COA B20TW2674C		Bill of Lading/Air Bill No. <b>423579546440</b>					
Shipped To <b>NSA 7/18/01 RECRA</b> <b>TM/RECRA LIONVILLE</b>				Offsite Property No. <b>A010322</b>									
POSSIBLE SAMPLE HAZARDS/REMARKS  Special Handling and/or Storage				Preservation	HNO3 to pH <2	Cool 4C	H2SO4 to pH <2 Cool 4C	HCl or H2SO4 to pH <2 Cool	Cool 4C	HNO3 to pH <2			
				Type of Container	aG	aG	aG	aGs*	aG	aG			
				No. of Container(s)	1	1	1	3	2	2			
				Volume	500mL	500mL	500mL	40mL	1000mL	1000mL			
SAMPLE ANALYSIS				See item (1) in Special Instructions.	See item (2) in Special Instructions.	Ammonia - 350.3; NO2/NO3 - 353.1; TOC - 9060	VOA - 8260A (TCL)	Semi-VOA - 8270A (Add-On) (Tributyl phosphate)	Gross Alpha; Gross Beta				
Sample No.	Matrix *	Sample Date	Sample Time										
B12DB4	WATER	8/10/01	0300	X	X	X	X	X					

<b>CHAIN OF POSSESSION</b>				<b>Sign/Print Names</b>		<b>SPECIAL INSTRUCTIONS</b>				<b>Matrix *</b>	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time	<b>** The ERC acknowledges that the analytical holding time for Nitrate by EPA Method 300.0 will not be met.</b>  (1) ICP Metals - 6010A (TAL) (Cadmium, Chromium, Copper, Nickel, Silver); ICP Metals - 6010A (Add-on) (Lead) (2) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate) <b>Samples did not originate in radiological controlled area. No total activity associated with sample/samples.</b>				S=Soil SD=Soil/Dredge SO=Soil/Dredge W=Water O=Oil A=Air DS=Dredge Solids DL=Dredge Liquids T=Time W=Wipe L=Liquid V=Vegetation X=Other			
<i>Greg Thomas</i>	8/10/01	<i>Ref 2C</i>	8/10/01								
<i>REF 2C</i>	8/10/01 1000	<i>S.IGALE</i>	8/10/01 1000								
<i>S.IGALE</i>	8/10/01 1000	<i>FED EX</i>									
<i>FED EX</i>	8-15-01 0940	<i>D. Simon</i>	8-15-01 0940								
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time								

<b>LABORATORY SECTION</b>	Received By	Title	Date/Time
<b>FINAL SAMPLE DISPOSITION</b>	Disposal Method	Disposed By	Date/Time

February 12, 1999

Figure 1. Sample Check-in List

Date/Time Received: 8-15-01SDG#: 0108L570

Work Order Number: \_\_\_\_\_

SAF# 301-059Shipping Container ID: SML286

Chain of Custody # \_\_\_\_\_

1. Custody Seals on shipping container intact? Yes ☒ No ☐
2. Custody Seals dated and signed? Yes ☒ No ☐
3. Chain-of-Custody record present? Yes ☒ No ☐
4. Cooler temperature 2.0°
5. Vermiculite/packing materials is Wet ☐ Dry ☒
6. Number of samples in shipping container: 8
7. Sample holding times exceeded? NO2, NO3, PO4 Yes ☒ No ☒ 8-15-01

8. Samples have:
- |                        |   |
|------------------------|---|
| <u>      </u> tape     | <u>      </u> hazard labels             |
| <u>✓</u> custody seals | <u>      </u> appropriate sample labels |

9. Samples are:
- |                            |                                |
|----------------------------|--------------------------------|
| <u>✓</u> in good condition | <u>      </u> leaking          |
| <u>      </u> broken       | <u>      </u> have air bubbles |

10. Were any anomalies identified in sample receipt? Yes ☐ No ☒

11. Description of anomalies (include sample numbers): \_\_\_\_\_

Sample Custodian/Laboratory: 1/5 ppal / LULI Date: 8-15-01

Telephoned to: \_\_\_\_\_ On \_\_\_\_\_ By \_\_\_\_\_